



Proposed Plan

CED Area – Study Area 01, Site 02, Site 03, and Study Area 04

Operable Unit 7

Former Naval Construction Battalion Center (NCBC) Center

North Kingstown, Rhode Island

THE PROPOSED CLEANUP

This Proposed Plan has been prepared in accordance with federal laws to present the United States Department of the Navy's (Navy) proposed cleanup approach for contaminated soil at Operable Unit (OU) 7, Study Area (SA) 01, Site 02, Site 03, and SA 04, which are collectively known as the Construction Equipment Department (CED) Area, located at the former Naval Construction Battalion Center (NCBC) Davisville, in North Kingstown, Rhode Island. This plan describes the Navy's proposed cleanup (remedy) for the CED Area which, after careful study, consists of:

- Soil – Soil removal with off-site disposal (or placement of soil cover) to protect commercial/ industrial workers at the CED Area. Land Use Controls (LUCs) will be established to prevent future residential use. Chemicals of concern (COCs) include polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals.
- Groundwater – The CED Area is located in an area where groundwater has been classified by the Rhode Island Department of Environmental Management (RIDEM) as "GB – may not be suitable for public or private drinking water use without treatment due to known or presumed degradation." The GB classification establishes standards to protect against non-drinking water exposure to groundwater contaminants but doesn't require restoration of the groundwater to drinking water standards. There is no risk from contact or vapor exposure from groundwater due to contamination from Navy operations. Groundwater contamination that has migrated from an off-base source onto the CED Area is being addressed through the United States Army Corps of Engineers (USCOE) Nike PR-58 groundwater remedy and is not part of this Proposed Plan (USCOE September 2018). The Navy will place a groundwater use restriction on OU7 to support USCOE's Nike PR-58 remedy. However, because there are no groundwater contaminant exceedances of the State's GB standards from Navy sources in the CED Area, no groundwater cleanup measures are required through this Navy remedial action.

Because after completion of the remedy contaminants will remain on-site at levels above those allowed for unrestricted use and unlimited exposure (UU/UE), five-year reviews of the ongoing protectiveness of the selected remedy will be performed as required by federal statute.

Opportunity for Public Comment

Public Comment Period

July 9 to August 8, 2020

The Navy will accept written comments on the Proposed Plan for the former CED Area - SA 01, Site 02, Site 03, and SA 04 during this comment period. Send written comments postmarked no later than August 8, 2020 to:

Mr. Todd Bober
Remedial Project Manager
BRAC PMO East
4911 South Broad Street
Philadelphia, PA 19112-1303

or email comments to todd.bober@navy.mil.

Virtual Public Meeting and Public Hearing

July 23, 2020

The Navy will host a Virtual Public Meeting and Hearing on Thursday July 23, 2020 to present and discuss the Proposed Plan and will accept comments during a Public Hearing. The Public Meeting will begin at 6:00 p.m. followed by the Public Hearing at 7:00 p.m.

To participate in the Virtual Public Meeting and Hearing, click on this link or type the address in your web browser: <https://tinyurl.com/NCBCOU7> then enter your name and email address and click the "Join Now" button.

For those without computer access you may participate by telephone at the following call-in number 408-418-9388 and using Access Code: 132 776 8609. Please contact the Navy Remedial Project Manager Mr. Todd Bober at (215) 897-4911 or todd.bober@navy.mil for the presentation materials.

For More Information

The technical and public information documents used by the Navy to prepare this Proposed Plan are available at the Information Repository located at:

Annex Building
Quonset Development Corporation
95 Cripe Street
North Kingstown, Rhode Island 02852
(401) 295-0044

Relevant documents can also be accessed through our website at:

https://www.bracpmo.navy.mil/brac_bases/northeast/construction_battalion_davisville.html

Click on the link for "Documents", then click on the "NCBC Davisville" link to view documents in the Administrative Record, and search on "Construction Equipment Department."

Introduction

This Proposed Plan provides information to the public on the Navy's preferred cleanup plan for soil at the CED Area located at former NCBC Davisville in North Kingstown, Rhode Island.

The CED Area is identified by the United States Environmental Protection Agency (U.S. EPA) as OU 7. This plan has been prepared to inform the community of the Navy's basis for the preferred cleanup approach for contaminated soils within the OU, and to encourage community participation on the Proposed Plan and environmental cleanup process for the CED Area at former NCBC Davisville.

Federal and state environmental laws govern cleanup activities at federal facilities. A federal law called the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), also known as Superfund, provides procedures for investigating and cleaning up environmental problems. Under this law, the Navy is pursuing cleanup at former NCBC Davisville, which is listed on the Superfund National Priorities List as the "Davisville Naval Construction Battalion Center Superfund Site."

The Navy works closely with the U.S. EPA and RIDEM. The Navy is the lead agency for all investigation and cleanup programs ongoing at former NCBC Davisville; U.S. EPA and RIDEM oversee the Navy's cleanup activities.

As the lead agency, the Navy has prepared this Proposed Plan for the CED Area in accordance with CERCLA Section 117(a) and Section 300.430(f) (2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal

Regulations Part 300). This plan and its associated public comment opportunities fulfill the Navy's public participation responsibilities under these legal requirements. The Proposed Plan was developed with support from the U.S. EPA and RIDEM.

The purpose of this Proposed Plan is to:

- Encourage public review and comment on this Proposed Plan.
- Provide background information on the CED Area, which includes: a description of the CED Area, a summary of the results of investigations, and the conclusions of the human health risk assessment (HHRA) and ecological risk assessment (ERA).
- Describe the Remedial Action Objectives (RAOs) for the CED Area.
- Describe Cleanup Alternatives (Remedial Alternatives) considered and evaluated by the Navy for the CED Area.
- Identify the Navy's preferred cleanup plan for the CED Area and explain the rationale for the preferred remedy.

Once the public has had the opportunity to review and comment on this Proposed Plan, the Navy, U.S. EPA, and RIDEM will carefully consider all comments received and, based on the comments, the Navy could modify the cleanup plan or even select a different remedy from the one currently proposed. Ultimately, the selected remedy will be documented in a Record of Decision (ROD) for the CED Area. The Navy will respond to all comments received during the comment period and public hearing in a document called the Responsiveness Summary. The Responsiveness Summary will be issued with the ROD.

This Proposed Plan presents the highlights of key information from previous investigations at the CED Area. More detailed information about the CED Area can be found in the 1998 Remedial Investigation (RI) Report (EA Engineering, Science, and Technology [EA] December 1998), the 2014 Human Health Risk Evaluation (HHRE) (Tetra Tech December 2014), the 2019 Focused Feasibility Study (FFS) (Resolution Consultants May 2019), related regulatory agency correspondence, and other documents that are part of the Administrative Record for this Proposed Plan, which can be accessed via the link in the *For More Information* text box at the top of this page.

The Navy encourages the public to review the related documents to gain a better understanding of the environmental activities completed at the CED Area that supported the development of this Proposed Plan.

Scope and Role of the Response Action

The CED Area is one of several sites identified for cleanup at former NCBC Davisville under the CERCLA process. Each site undergoing cleanup under CERCLA progresses through the process independently of others, and as such, this plan is not expected to impact the strategy or progress of cleanup for other sites at former NCBC Davisville. Separate Proposed Plans have been, and will be, issued for these other sites as they progress through the investigation and cleanup process.

This Proposed Plan addresses soil impacts at the CED Area (OU7) where CERCLA contaminants were released.

NCBC Davisville Background and Characteristics

Former NCBC Davisville is in the Town of North Kingstown, Rhode Island, approximately 18 miles south of Providence. The NCBC Davisville mission was to provide mobilization support to the active Naval Construction force; to act as a mobilization base for the rapid assembly, outfitting, and readying of Reserve Construction Battalions; to store, preserve, and ship advance base and mobilization stocks; and to procure, receive, pack, and ship equipment for Atlantic, European, and Caribbean military construction projects. The NCBC was composed primarily of warehouse space and freight yards, most of which have been demolished or redeveloped. The base was decommissioned in March 1994, and closed on April 1, 1994, under the Base Realignment and Closure (BRAC) program.

Geology and Hydrogeology

Subsurface geology in the area is characterized by Quaternary glacial deposits mantling quartzitic and phyllitic bedrock (weathered and competent zones). The unconsolidated sedimentary (fill, intertidal, and glacial) deposits consist of the following units, in descending order:

- Undifferentiated reworked soil and fill material from historical regrading at portions of the site
- Glacio-fluvial, glacio-lacustrine, and lower sand deposits (silts, sands, and gravels) (typically defined as two different units)
- Sandy silty gravel to gravelly sand to sandy gravelly silt (a glacial till)

Groundwater flow in the CED Area is generally to the east, although a northeastern component also occurs (near the CED Drum Removal Area). Additionally, a minor southeastern component also occurs in the eastern portion of the site. Overall groundwater flow paths and gradients are similar between the

overburden and bedrock. However, groundwater flow in the shallow bedrock is more southeasterly compared to the deep overburden, in which flow is dominantly to the east.

Groundwater at the CED Area is classified by RIDEM as GB: "groundwater which may not be suitable for public or private drinking water use without treatment due to known or presumed degradation" (RIDEM September 2009). RIDEM has assessed the Use and Value of the aquifer, based on U.S. EPA groundwater guidance standards, and determined that the aquifer is of "low" Use and Value consistent with its GB classification (RIDEM January 2020). At former NCBC Davisville, the areas where the groundwater is classified GB are served by public water systems.

CED Area Background and Characteristics

Where is the CED Area?

The CED Area, part of former NCBC Davisville, is located immediately west of Marine Road, east of the former Nike PR-58 Site, and north of Davisville Road and the Davol Pond system (Figure 1). Undeveloped property, residential private property, and a paved biking/walking path borders the area to the north. The area immediately north of the biking/walking path is mostly undeveloped common land held by the Carriage Hill Association. The CED Area currently has no structures, encompasses approximately 74 acres, and includes SA 01, Site 02, Site 03, and SA 04 (Figure 1). The CED Area also includes a Drum Removal Area, however, this area is not identified as a "Site" or "SA".

SA 01

SA 01, located in the northeast corner of the CED Area near the intersection of former Perimeter Road and Marine Road, is an open field with a drainage ditch along its western bounds and small paved area in its southernmost area (Figure 1). SA 01 was used to store 55-gallon drums of solvents and waste oil from the late 1960s to 1974, with as many as 500 drums stored at one time. Prior investigations determined the conditions of the drums were deteriorated, and liquids may have leaked onto the ground (Fred C. Hart and Associates September 1984). The drums were removed in 1974, and from December 1991 to April 1992, the area was briefly used as a leaching field for disposal of surface water runoff and storm water from a truck washing area located at Building 224. Sand blast grit from a sand blasting area inside former Building S-41 was also transported through the storm sewer system to the southern end of the drainage ditch (Halliburton NUS September 1994).

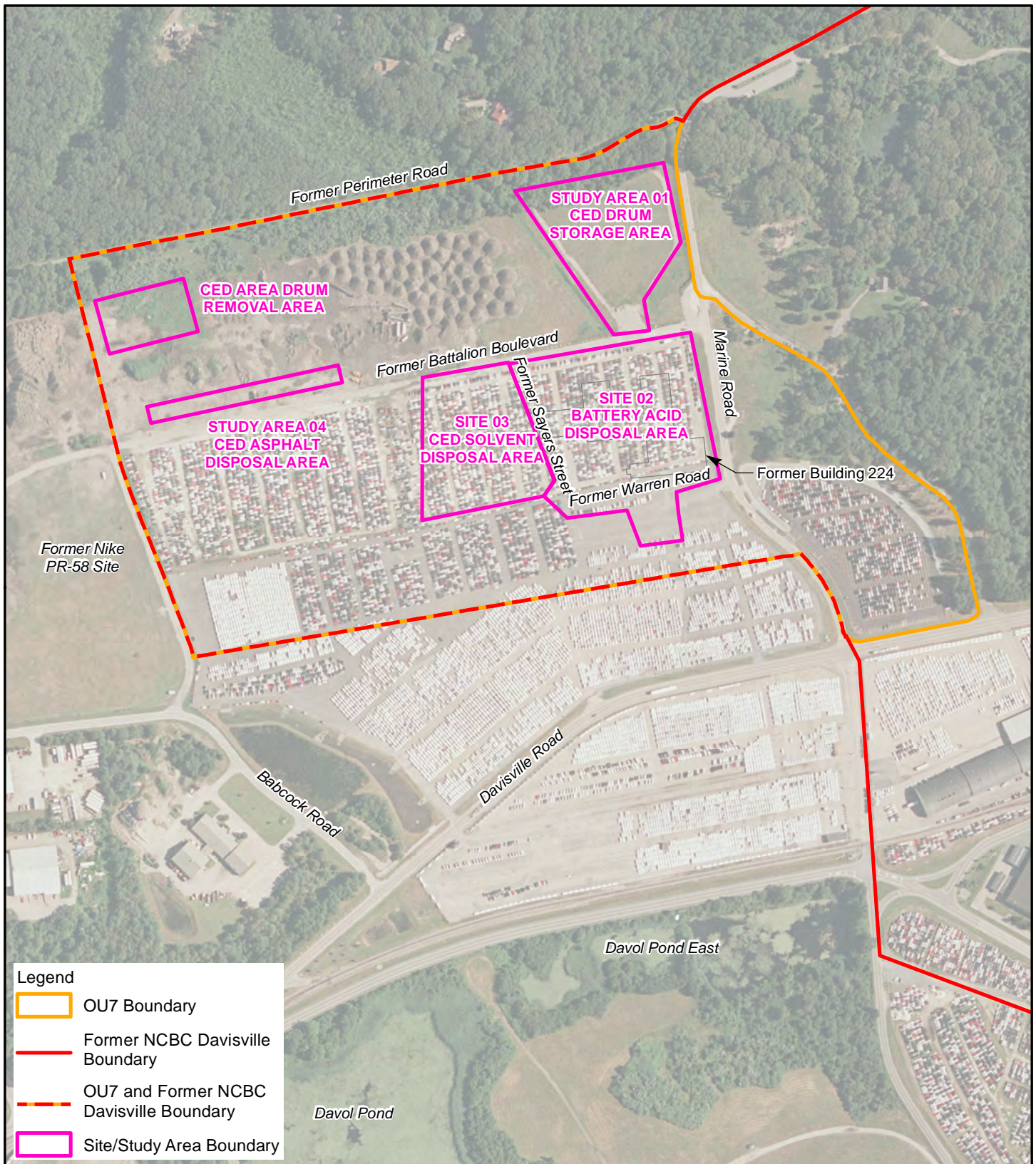


FIGURE 1
SITE LOCATION MAP
OPERABLE UNIT 7 CED AREA

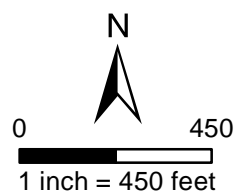
FORMER NCBC DAVISVILLE
NORTH KINGSTOWN, RI



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Project #: 60273164



Site 02

Site 02, a formerly paved flat area, is bordered by former Battalion Boulevard to the north, Marine Road to the east, former Warren Street to the south, and former Sayers Street to the west (Figure 1). The site consisted of a former dry well and leaching field and does not include former Building 224. Dilute sulfuric acid from batteries (reportedly containing lead) was transported through a floor drain in Building 224 to the dry well and leaching field between 1955 and 1980. It is estimated that a total of 18,000 gallons of dilute sulfuric acid were disposed of in the dry well and leaching field at a rate of 60 gallons per month. In 1996, the Navy performed a time-critical removal action (TCRA) that removed and transported off-site for disposal lead-contaminated soil in the leaching field along with the associated piping, cleaned the battery acid room in and around Building 224, and decommissioned three monitoring wells (Foster Wheeler September 1996). A refueling area with underground storage tanks was also located in Site 02; the Navy removed these tanks in 1992.

Site 03

Site 03, a formerly paved lot, is located directly west of Site 02 and south of former Battalion Boulevard (Figure 1). From 1955 to the late 1970s, it is thought that the disposal of paint thinners and unidentified solvents onto the ground occurred in the area bordering former Sayers Street, although the exact locations and limits of contaminant disposal are uncertain. It is estimated that a total of 3,000 gallons of solvents were disposed of at the site at a rate of 10 gallons per month. Heavy equipment storage also took place on a portion of Site 03.

SA 04

SA 04 is located 800 feet west of former Building 224 and north of former Battalion Boulevard (Figure 1). In the late 1960s, a black, pliable, asphaltic material from an unknown source was deposited in a trench in this area. This material and adjacent soils contained PCBs and total petroleum hydrocarbons (TPH). In 1996, the Navy removed the material and associated contaminated soil.

CED Drum Removal Area

The CED Drum Removal Area is in the northwest corner of the CED Area, approximately 200 feet south of former Perimeter Road (Figure 1). In April 2013, Quonset Development Corporation (QDC), the local redevelopment authority, discovered several drums while performing routine grading and boulder removal in this undeveloped portion of the CED Area. In June 2013, a geophysical survey was conducted to assess the extent of buried drums for removal consideration

and in October 2013, the Navy performed a TCRA that removed nine crushed drums from the area and collected soil samples from beneath the drums (Navy December 2013). The soil results showed no exceedances of industrial or residential screening criteria (Tetra Tech-EC June 2014).

Building 224 is the main building that historically existed at the CED Area. Building 224 was demolished as part of QDC's redevelopment activities at the CED Area. Several other smaller buildings historically existed at the CED Area including Building S-41, Building A10CT, and Building 378. These buildings have also been demolished as part of QDC's redevelopment activities.

What caused the soil contamination at the CED Area?

The historical activities that are believed to have resulted in soil contamination at the CED area include leaking of drums, leaching field operations, and sand blasting at SA 01; disposal of dilute sulfuric acid to the drywell and subsequent leaching field at Site 02; disposal of solvents and paint thinners to the ground at Site 03; and burial of asphaltic material at SA 04.

The primary contaminants in soil include PAHs, PCBs, and metals (including lead).

At **SA 01**, elevated concentrations of lead, manganese, and the PAHs benzo(a)pyrene and chrysene are present in soil. The presence of lead and manganese may be due to leaking of drum contents that contained these metals. The presence of lead may also be due to sandblasting of lead paint and the subsequent transport of the sand blast grit to the drainage ditch. The presence of benzo(a)pyrene and chrysene may be due to leaking of drum contents that contained petroleum-based products and/or disposal of petroleum-containing truck washing water to the leaching field.

At **Site 02**, elevated concentrations of antimony, beryllium, cadmium, lead, and manganese are present in subsurface soil. The disposal of sulfuric acid from batteries into the dry well and leaching field is the likely source of these metals in soil.

At **Site 03**, elevated concentrations of lead and manganese are present in soil. The presence of these metals may be due to the disposal of solvents and paint thinners to the soil.

At **SA 04**, elevated concentrations of antimony, lead, manganese, and the PCB Aroclor-1260 are present in soil, and are likely related to the asphaltic material that was buried in SA 04.

What does the CED Area look like today?

The current and anticipated future land use of the CED Area is industrial/commercial uses to support the Port of Davisville. The CED Area is owned by the Navy and leased to QDC under a Lease in Furtherance of Conveyance. The QDC then subleases the CED Area to the North Atlantic Distribution Inc., a commercial automotive company. Currently, there are no buildings in the CED Area.

The portion of the CED area between former Battalion Boulevard and Former Warren Road is level and consists of dirt parking lots used for the storage of used foreign cars pending shipment back to their country of origin. The area south of former Warren Road is paved and used for storage of imported new foreign cars pending delivery to automotive dealers. The portion of the CED area north of former Battalion Boulevard is mostly open land with dense vegetation along the northern perimeter. The QDC stages several soil piles in this part of the CED Area. The land is mostly level, with some depressions in the area of SA 01. A drainage ditch exists along with western edge of SA 01. The CED Area does not lie within a 100-year or 500-year coastal floodplain of Narragansett Bay.

What chemicals of concern are present at the CED Area and where are they located?

A risk assessment was performed as part of the Phase III RI (EA December 1998) and an additional HHRE was performed in 2014 (Tetra Tech January 2014).

Based on the results of the risk assessment and HHRE, COCs in soil were identified at the CED Area that could pose risk to human receptors (either exceeding U.S. EPA risk thresholds or RIDEM Residential [R] or Industrial/Commercial [I/C/] Direct Exposure Criteria [DEC]), as summarized in Table 1. Further details on the risk assessments are provided in the Summary of Site Risks section of this Proposed Plan.

Figures 2 through 5 show historical sampling locations and a comparison of site data to applicable standards and guidance, with exceedances highlighted.

The total area of contaminated soil is estimated to be approximately 48,000 square feet, and the estimated depth of contamination is generally 2 to 4 feet below ground surface (bgs) with two locations at 10 feet and 14 feet bgs. All locations exhibiting soil contamination are in the unsaturated zone. The estimated volume of soil with exceedances of EPA risk thresholds or RIDEM R DEC is approximately 6,900 cubic yards (CY). The estimated volume of soil with exceedances of the RIDEM I/C DEC is approximately 1,540 CY that covers an area of approximately 8,800 square feet.

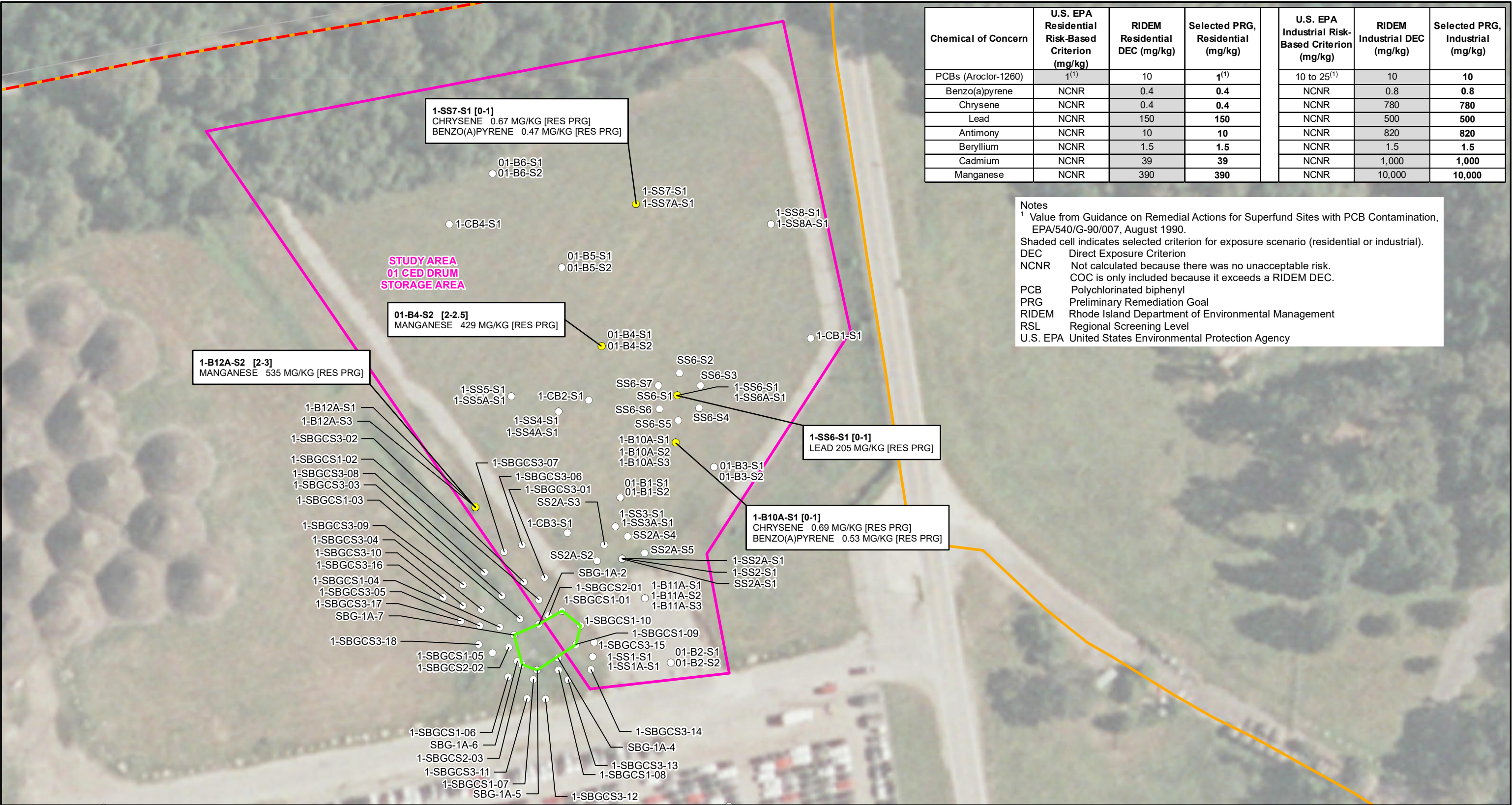
Although not a CERCLA contaminant, TPH greater than the RIDEM R DEC is present in soil at Site 02 and Site 03. Remedial action for TPH will be performed under separate RIDEM authority and is therefore not addressed in this Proposed Plan.

Table 1
Contaminants of Concern

Chemical	Study Area 01	Site 02	Site 03	Study Area 04
Aroclor-1260	Not a COC	Not a COC	Not a COC	Exceeds U.S. EPA risk thresholds
Benzo(a)pyrene	Exceeds RIDEM R DEC	Not a COC	Not a COC	Not a COC
Chrysene	Exceeds RIDEM R DEC	Not a COC	Not a COC	Not a COC
Antimony	Not a COC	Exceeds RIDEM R DEC	Not a COC	Exceeds RIDEM R DEC
Beryllium	Not a COC	Exceeds RIDEM R and I/C DEC	Not a COC	Not a COC
Cadmium	Not a COC	Exceeds RIDEM R DEC	Not a COC	Not a COC
Lead	Exceeds RIDEM R	Exceeds RIDEM R and I/C DEC	Exceeds RIDEM R and I/C DEC	Exceeds RIDEM R and I/C DEC
Manganese	Exceeds RIDEM R DEC	Exceeds RIDEM R DEC	Exceeds RIDEM R DEC	Exceeds RIDEM R DEC


Notes:

COC Contaminant of Concern
RIDEM Rhode Island Department of Environmental Management
R Residential
I/C Industrial/Commercial
DEC Direct Exposure Criteria



Chemical of Concern	U.S. EPA Residential Risk-Based Criterion (mg/kg)	RIDEM Residential DEC (mg/kg)	Selected PRG, Residential (mg/kg)	U.S. EPA Industrial Risk-Based Criterion (mg/kg)	RIDEM Industrial DEC (mg/kg)	Selected PRG, Industrial (mg/kg)
PCBs (Aroclor-1260)	1 ⁽¹⁾	10	1 ⁽¹⁾	10 to 25 ⁽¹⁾	10	10
Benzo(a)pyrene	NCNR	0.4	0.4	NCNR	0.8	0.8
Chrysene	NCNR	0.4	0.4	NCNR	780	780
Lead	NCNR	150	150	NCNR	500	500
Antimony	NCNR	10	10	NCNR	820	820
Beryllium	NCNR	1.5	1.5	NCNR	1.5	1.5
Cadmium	NCNR	39	39	NCNR	1,000	1,000
Manganese	NCNR	390	390	NCNR	10,000	10,000

Notes
1 Value from Guidance on Remedial Actions for Superfund Sites with PCB Contamination, EPA/540/G-90/007, August 1990.
Shaded cell indicates selected criterion for exposure scenario (residential or industrial).
DEC Direct Exposure Criterion
NCNR Not calculated because there was no unacceptable risk.
COC is only included because it exceeds a RIDEM DEC.
PCB Polychlorinated biphenyl
PRG Preliminary Remediation Goal
RIDEM Rhode Island Department of Environmental Management
RSL Regional Screening Level
U.S. EPA United States Environmental Protection Agency



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Legend

- Soil Sample Location
- Soil Sample With Residential PRG Exceedance
- Soil Sample With Industrial PRG Exceedance
- 2018 Maintenance Action
- OU7 Boundary
- OU7 and Former NCBC Davisville Boundary
- Site/Study Area Boundary

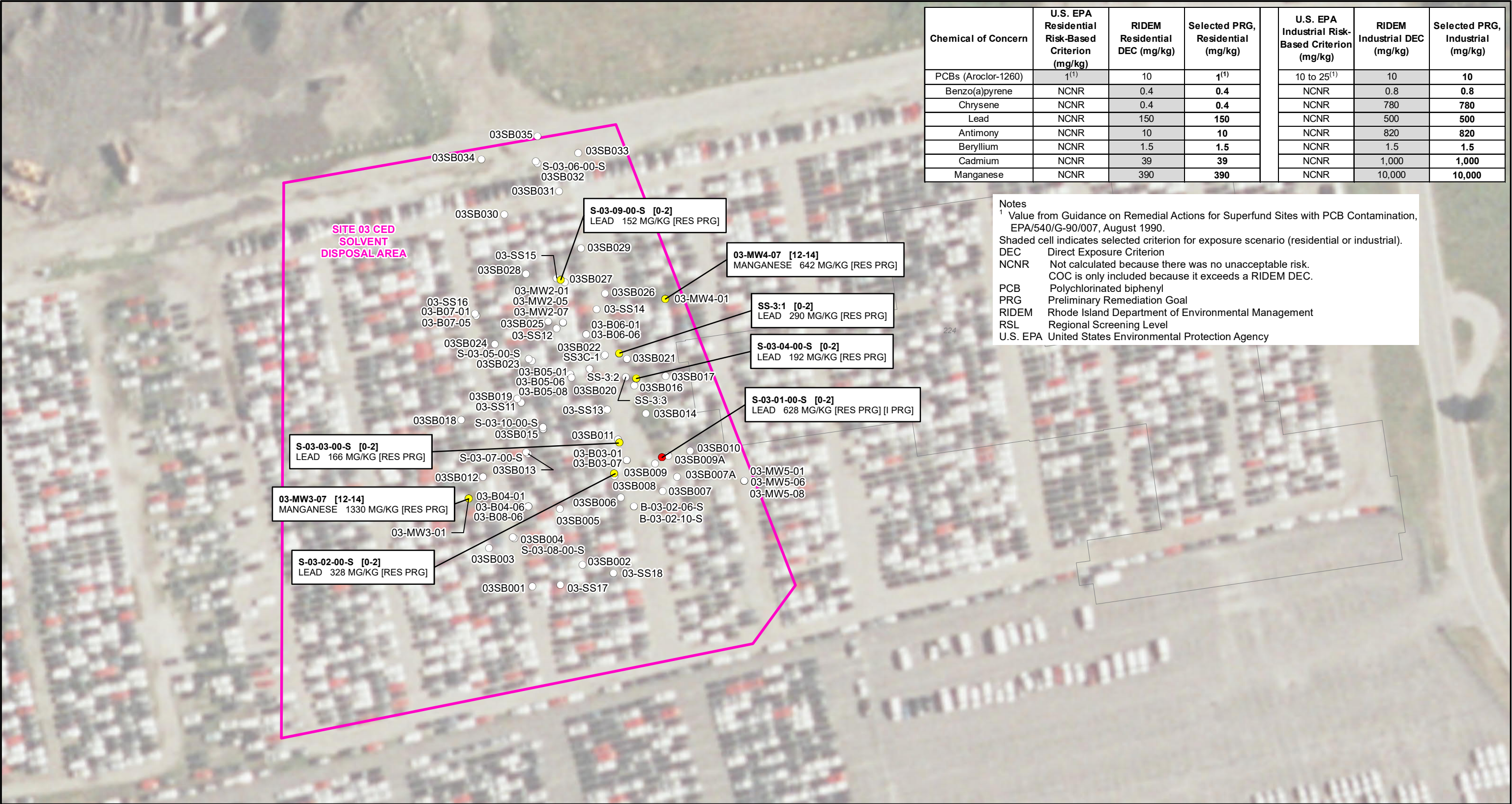
SAMPLE LOCATION [DEPTH INTERVAL, FEET BGS]
ANALYTE CONCENTRATION (MG/KG) [RES PRG: RESIDENTIAL PRG]
[I PRG: INDUSTRIAL PRG]

0 80

1 inch = 80 feet


FIGURE 2
STUDY AREA 01 - EXCEEDANCES
OF STANDARDS/CRITERIA
OPERABLE UNIT 7 CED AREA

FORMER NCBC DAVISVILLE
NORTH KINGSTOWN, RHODE ISLAND



Chemical of Concern	U.S. EPA Residential Risk-Based Criterion (mg/kg)	RIDEM Residential DEC (mg/kg)	Selected PRG, Residential (mg/kg)	U.S. EPA Industrial Risk-Based Criterion (mg/kg)	RIDEM Industrial DEC (mg/kg)	Selected PRG, Industrial (mg/kg)
PCBs (Aroclor-1260)	1 ⁽¹⁾	10	1 ⁽¹⁾	10 to 25 ⁽¹⁾	10	10
Benzo(a)pyrene	NCNR	0.4	0.4	NCNR	0.8	0.8
Chrysene	NCNR	0.4	0.4	NCNR	780	780
Lead	NCNR	150	150	NCNR	500	500
Antimony	NCNR	10	10	NCNR	820	820
Beryllium	NCNR	1.5	1.5	NCNR	1.5	1.5
Cadmium	NCNR	39	39	NCNR	1,000	1,000
Manganese	NCNR	390	390	NCNR	10,000	10,000

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Shaded cell indicates selected criterion for exposure scenario (residential or industrial).
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NCNR Not calculated because there was no unacceptable risk.
COC is only included because it exceeds a RIDEM DEC.
PCB Polychlorinated biphenyl
PRG Preliminary Remediation Goal
RIDEM Rhode Island Department of Environmental Management
RSL Regional Screening Level
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Legend

- Soil Sample Location
- Soil Sample With Residential PRG Exceedance
- Soil Sample With Industrial PRG Exceedance
- Site/Study Area Boundary

SAMPLE LOCATION [DEPTH INTERVAL, FEET BGS]
ANALYTE CONCENTRATION (MG/KG) [RES PRG: RESIDENTIAL PRG]
[I PRG: INDUSTRIAL PRG]



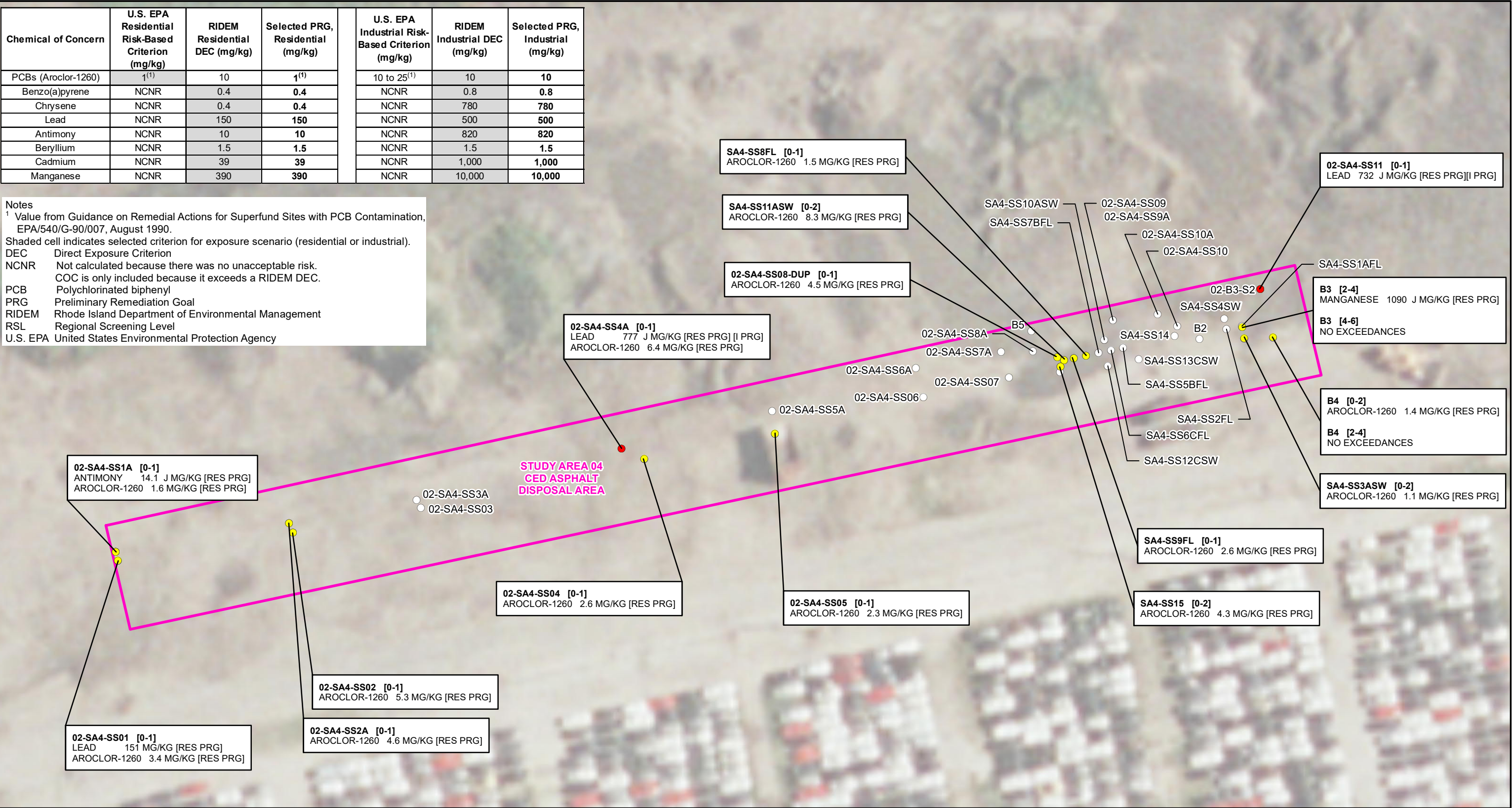
1 inch = 80 feet


FIGURE 4
SITE 03 - EXCEEDANCES
OF STANDARD/CRITERIA
OPERABLE UNIT 7 CED AREA

FORMER NCBC DAVISVILLE
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Concern	U.S. EPA Residential Risk-Based Criterion (mg/kg)	RIDEM Residential DEC (mg/kg)	Selected PRG, Residential (mg/kg)	U.S. EPA Industrial Risk-Based Criterion (mg/kg)	RIDEM Industrial DEC (mg/kg)	Selected PRG, Industrial (mg/kg)
PCBs (Aroclor-1260)	1 ⁽¹⁾	10	1 ⁽¹⁾	10 to 25 ⁽¹⁾	10	10
Benzo(a)pyrene	NCNR	0.4	0.4	NCNR	0.8	0.8
Chrysene	NCNR	0.4	0.4	NCNR	780	780
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Cadmium	NCNR	39	39	NCNR	1,000	1,000
Manganese	NCNR	390	390	NCNR	10,000	10,000

Notes
¹ Value from Guidance on Remedial Actions for Superfund Sites with PCB Contamination, EPA/540/G-90/007, August 1990.
Shaded cell indicates selected criterion for exposure scenario (residential or industrial).
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NCNR Not calculated because there was no unacceptable risk.
COC is only included because it exceeds a RIDEM DEC.
PCB Polychlorinated biphenyl
PRG Preliminary Remediation Goal
RIDEM Rhode Island Department of Environmental Management
RSL Regional Screening Level
U.S. EPA United States Environmental Protection Agency



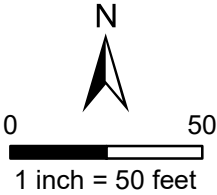


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SAMPLE LOCATION [DEPTH INTERVAL, FEET BGS]
ANALYTE CONCENTRATION (MG/KG) [RES PRG: RESIDENTIAL PRG]
[I PRG: INDUSTRIAL PRG]



History of Site Investigations and Removal Actions

1984 Initial Assessment Study: SAs 01 and 04 and Sites 02 and 03 were identified in the Initial Assessment Study but were not recommended for Confirmation Study (Fred C. Hart and Associates September 1984). However, RIDEM requested that Sites 02 and 03 be included in the Confirmation Study in 1984 (TRC Environmental Consultants July 1994). Additionally, the Navy elected to conduct SA screening evaluations for SAs 01 and 04.

1987 Confirmation Study – Verification Step: At Site 02, one deep subsurface soil and one groundwater sample were collected, and based on the results, the study recommended installation of three more monitoring wells. At Site 03, four surface soil samples were collected, and based on the results, the study recommended the installation of additional wells (TRC Environmental Consultants February 1987).

1989 National Priority List: NCBC Davisville was proposed by the U.S. EPA for inclusion on the National Priority List in July 1989. NCBC Davisville was added to the National Priority List on November 21, 1989.

1989-1990 Phase I RI: This RI was conducted at Site 02 and 03 and an HHRA was prepared. No action was recommended for soil, and no action/continued monitoring was recommended for groundwater at both sites (TRC Environmental Consultants July 1994).

1994 SA Screening Evaluations: At SA 01, surface water, groundwater, and sediment (catch basin) samples were collected, and groundwater, surface water, soil, and air exposure pathways and risk were considered (Halliburton NUS September 1994). An addendum to the 1994 report presented a risk screening evaluation for industrial receptors only; risks to residential receptors were not evaluated. No potential risks exceeding acceptable levels were identified (Halliburton NUS March 1995). At SA 04, surface and subsurface soil samples were collected, and groundwater, surface water, soil, and air exposure pathways and risk were considered. The soil results at SA 04 indicated a potential elevated risk to hypothetical residential receptors (Halliburton NUS September 1994).

1994 Phase II RI: This RI was conducted at Sites 02 and 03. Additional well installation and monitoring was recommended for both sites to determine the chlorinated volatile organic compound source in groundwater (TRC Environmental Consultants July 1994).

1996 SA 04 Removal Action: Asphaltic material and adjacent TPH- and PCB-contaminated soil were

removed in November and December (Stone & Webster June 1997).

1996 Draft Final Facility-Wide Freshwater/ Terrestrial Ecological Risk Assessment: The facility-wide ERA reported potentially unacceptable ecological risks for terrestrial receptors in Sites 02 and 03 and SAs 01 and 04. The ERA suggested that more detailed evaluation and apportionment of exposure risk was necessary to support decision making at the site (EA February 1996).

1998 Phase III RI: Field work for the Phase III RI was conducted between 1995 and 1998. Samples were collected to perform an HHRA to determine whether potential unacceptable human health risk was associated with chemical concentrations in surface and subsurface soil, groundwater, and air at Sites 02 and 03 (EA December 1998 and November 2000).

2000 Technical Memorandum, Ecological Risk Evaluation: This memorandum evaluated potential ecological risks at IR Program Site 02, Site 03, SA 01, and SA 04. Acceptable ecological risks were calculated for SA 01, Site 02, or SA 04. Potentially unacceptable ecological risks were initially identified for cadmium at Site 03; however, based on an additional evaluation of cadmium toxicity and the limited habitat represented at the site, risks from cadmium were determined to be negligible. Therefore, the memorandum concluded there were no unacceptable risks to ecological receptors in Site 02, Site 03, SA 01, or SA 04 (EA November 2000).

2000 Feasibility Study: The Feasibility Study (FS) for the four sites was based on the results of the RI Reports and HHRAs. No action was required for soil, and only LUCs and long-term monitoring alternatives were considered for groundwater (EA August 2000).

2004 Initial Screening of Remedial Alternatives: The evaluation was based on the RI Reports, FS, results of three subsequent rounds of groundwater sampling, and an additional characterization study of chlorinated volatile organic compound contamination at the former Nike PR-58 Site and Site 03. Like the 2000 FS, the only alternatives considered were no action for soil and LUCs and long-term monitoring for groundwater (EA December 2004).

2013 Time-Critical Removal Action: In April 2013, drums were discovered to the northwest of SA 04 ("CED Drum Removal Area") and a geophysical survey was conducted in June 2013 to assess the extent for removal consideration. In October 2013, the Navy removed nine crushed drums from the area. Soil samples were collected from beneath the drums showed no exceedances of industrial or residential screening criteria (Tetra Tech-EC June 2014).

2014 TPH Delineation at CED Area Site 03 and Additional Groundwater Sampling at Sites 02 and 03 and the Drum Removal Area: Soil samples were collected at Site 03 to delineate TPH contamination identified during the RI. Groundwater samples were collected at Sites 02 and 03 to investigate the potential for chemical migration from soil to groundwater and the potential for vapor migration from groundwater to the indoor air should a building be constructed at the CED Area. Groundwater samples were also collected at the Drum Removal Area to evaluate the potential for groundwater contamination from the drums (Tetra Tech April 2015).

2014 HHRE for Soil: A HHRE was performed to evaluate potential risks to human receptors exposed to surface and subsurface soil under various land use scenarios. The HHRE used existing site data and current guidance to validate the conclusions of prior HHRAs. Soil data was also evaluated according to the Compliance Sampling methodology in Rule 8.10 of RIDEM's Remediation Regulations (Tetra Tech January 2014).

2016 Nike PR-58 Site Final RI/FS: This report concluded that the contaminated groundwater plume beneath the CED Area originated primarily from the former Nike PR-58 Site (USCOE June 2016).

2017 Sampling at SA 01: In fall 2017, an investigation was conducted to delineate the lateral and vertical extent of the lead-impacted soil above the RIDEM I/C DEC of 500 milligrams per kilogram (mg/kg) at SA 01 (Resolution Consultants May 2018).

2018 Nike PR-58 Decision Document: A comprehensive groundwater remedy has been selected by the USCOE to address the offsite migration of contaminants and achieve remedial goals within the source area and across the entire contaminant plume, including the groundwater beneath the CED Area (USCOE September 2018).

2018: In June 2018, a Maintenance Action was performed in SA 01 to remove soil above the RIDEM I/C DEC of 500 mg/kg that was delineated in the 2017 sampling effort.

Summary of Site Risks

As a part of the RIs, the Navy completed risk assessments to determine the potential current and future risks posed to human health and the environment due to exposure to contaminants located at the CED Area. An additional HHRE was performed in 2014 to update the previous HHRAs with respect to current risk assessment guidance. The predicted risks were considered in the cleanup decision-making process for the CED Area.

Understanding Human Health Risk Assessments

In evaluating risks to humans, risk estimates for carcinogens (chemicals that may cause cancer) and noncarcinogens (chemicals that may cause adverse effects other than cancer) are expressed differently.

For **carcinogens**, risk estimates (referred to as Incremental Lifetime Carcinogenic Risks) are expressed in terms of probability. For example, exposure to a particular carcinogenic chemical may present a 1 in 10,000 chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as 1×10^{-4} . The U.S. EPA acceptable risk range for carcinogens is 10^{-6} to 10^{-4} . In general, calculated risks higher than these values would require consideration of cleanup.

For **noncarcinogens**, exposures are first estimated and then compared to a reference dose (RfD). The RfD is developed by U.S. EPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without developing adverse (non-cancer) health effects. The exposure dose is divided by the RfD to calculate the measure known as a hazard index (HI). A HI greater than 1 suggests that adverse effects are possible.

Summaries of the HHRAs and ERAs for the CED Area are presented below. These assessments were used to identify COCs for the sites.

Human Health Risks

The HHRA estimated the baseline risk, which is the increased probability for health effects occurring from exposure to site media (e.g., soil) if no cleanup actions were taken at the CED Area. To estimate the baseline risk health, a four-step process was used. The information below summarizes the findings of the 2014 HHRE which updated the previously conducted HHRAs.

Step 1 – Identify Chemicals of Potential Concern

Chemicals of potential concern (COPCs) are chemicals found at the site in concentrations above federal and state default-based risk-screening levels and/or background levels, where applicable. Chemicals with concentrations above these levels were further evaluated in Step 2.

Step 2 – Conduct an Exposure Assessment

The ways that humans could come into contact with the identified COPCs were evaluated. Both current and reasonably foreseeable future exposure scenarios were considered. For the CED Area, the exposure

scenarios included: residents (child, adult, and lifelong), recreational users (child, adult, and lifelong), construction workers, and industrial workers who could come in contact with site soil through direct contact, ingestion, and/or inhalation of particulates (dust).

Risks were estimated in Step 4 for future industrial use, hypothetical future residential land use, current and future construction/redevelopment, and future recreational land use. Although all receptors were evaluated for exposures to both surface and subsurface soils, the construction worker is the only receptor likely to contact subsurface soil.

It should be noted that the CED Area is expected to continue to be redeveloped as an industrial parking lot to store imported foreign cars. Residential development is not included in the development plans for the CED Area. However, this use is evaluated as a hypothetical scenario as a conservative baseline in the risk assessment process to provide a basis for the need for a cleanup action.

Step 3 – Complete a Toxicity Assessment

Possible harmful effects associated with potential exposure to the COPCs were evaluated. Generally, these COPCs were separated into two groups: carcinogens (chemicals that may cause cancer) and non-carcinogens (chemicals that may cause adverse health effects other than cancer).

Step 4 – Characterize the Risk

The results of Steps 2 and 3 were combined to estimate overall risks from exposure to the COPCs for the CED Area. The terms used to define the estimated risk are explained in the text box on this page entitled *Understanding Human Health Risk Assessments*.

The incremental lifetime cancer risks for soil were less than or within the U.S. EPA target range of 10^{-4} to 10^{-6} (i.e., a one-in-ten thousand to one-in-one million probability of developing cancer). However, the HI calculated for the hypothetical future resident exposed to soils at SA 04 exceeds the U.S. EPA target value of 1 (an indication of the potential for adverse non-carcinogenic health effects) for the PCB Aroclor-1260. Only SA 04 has an unacceptable Aroclor-1260 non-cancer risk for residential exposure to soil. The non-cancer risks at the other three sites were determined to be acceptable for the scenarios evaluated.

Although unacceptable risks were not identified for lead, the Navy also conducted a lead evaluation to determine the estimated probabilities that modeled blood lead levels greater than 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$) would exceed the U.S. EPA threshold probability of 5% for all receptors. The lead

evaluation considered both the arithmetic mean concentration and a 95 percent upper confidence limit of the mean concentration. There were no exceedances of the U.S. EPA threshold probability for any receptors using the 10 $\mu\text{g}/\text{dL}$ blood lead levels.

At the request of U.S. EPA, the lead modeling was also performed for the same receptors based on the Center for Disease Control and Prevention May 2012 blood lead reference value of 5 $\mu\text{g}/\text{dL}$. Using the 5 $\mu\text{g}/\text{dL}$ reference value and a 95 percent upper confidence limit (the most conservative scenario), the evaluation indicated exceedances of the U.S. EPA threshold probability for residents exposed to Site 02 subsurface soil, Site 03 surface soil, and SA 04 surface soil. No unacceptable lead risks for residents were noted when the 5 $\mu\text{g}/\text{dL}$ reference value and the arithmetic mean were considered. No unacceptable lead risks were noted for industrial workers or construction workers.

Summary of the Human Health Risk Assessment

For surface soil, concentrations of PCBs (Aroclor-1260) at SA 04 were found to pose potential unacceptable risks to human health under a hypothetical future residential use scenario for ingestion, dermal contact, and particulate inhalation.

No unacceptable human health risks were identified for industrial workers, construction workers, or recreational users potentially exposed to surface and/or subsurface soils at the site.

In addition to the unacceptable risk for Aroclor-1260 at SA 04, the entire CED Area must be remediated to meet Applicable Relevant and Appropriate Requirements (ARARs). RIDEM R and I/C DEC are ARARs and must also be met across the CED Area.

- Locations at SA 01 have concentrations greater than the RIDEM R DEC.
- Locations at Site 02, Site 03, and SA 04 have concentrations greater than the RIDEM R and I/C DEC.

Ecological Risks

An ERA was conducted in 1996 and presented in the *Draft Final Facility-Wide Freshwater/Terrestrial Ecological Risk Assessment* (EA February 1996). A ten-step process outlined in *Technical Memorandum, Ecological Risk Evaluation for IRP Sites 02 and 03 and Study Areas 01 and 04* (EA November 2000) was followed to evaluate the findings of the ERA conducted for the CED Area and to assess the need for remedial action. The results of the risk evaluation are summarized herein.

Step 1 – Select a Risk Threshold and Identify Watershed-Specific Risk Drivers

A hazard quotient (HQ) of 10 was selected as the threshold for terrestrial-based receptors of concern (robin, hawk, and shrew) to identify chemicals considered potential “risk-drivers” for ecological receptors at the site. All chemical/receptor scenarios in the 1996 ERA with HQs greater than 10 were identified for further evaluation in the 2000 ERA Evaluation. A HQ of 10 was used due to the current and anticipated future use of the site (parking lot) and the minimal habitat for ecological receptors.

Sites 02 and 03 and SAs 01 and 04 are located in close proximity within the Hall Creek watershed. Ten chemicals were identified with watershed generated food-web HQs greater than 10, including cadmium, fluorene, dichlorodiphenyltrichloroethane, dichlorodiphenyldichloroethylene, Aroclor-1248, Aroclor-1254, Aroclor-1260, dieldrin, endrin, and endrin ketone.

Using scaling, the concentration of each chemical that would be equivalent to a calculated HQ of 10 for that receptor was calculated. If more than one receptor reported a HQ greater than 10 for a chemical, the highest HQ/receptor-scenario was selected. The resulting HQ=10 equivalent concentrations were selected as preliminary remediation goals (PRGs) and compared to analytical data to determine potential unacceptable risks.

Step 2 – Evaluate the Need for Remedial Action

SA 01

No analyte concentrations in SA 01 exceeded the ecological PRGs at the HQ=10 level. Therefore, no potential ecological risk drivers were identified for SA 01.

Site 02

No analyte concentrations at Site 02 exceeded the ecological PRGs at the HQ=10 level. Therefore, no potential ecological risk drivers were identified for Site 02.

Site 03

Cadmium was identified as a potential risk driver at Site 03. Six surface soil locations reported concentrations greater than the ecological PRG of 0.83 mg/kg at the HQ=10 level, based on food web modeling for the shrew conducted as part of the ERA (EA February 1996). A re-evaluation of shrew risks with a toxicity reference value published after the completion of the ERA reduced the HQ=10 equivalent concentration to 7.33 mg/kg and all surface soil concentrations were below this level. Therefore, the

risk evaluation (EA November 2000) recommended that cadmium be removed as a COC for Site 03.

In addition, cadmium concentrations at Site 03 were reported to be within the natural background ranges for Rhode Island and below additional available benchmark screening values (plant, invertebrate, microbial, and earthworm).

Site 03 consists of 12 acres with areas of deteriorated asphalt interspersed with grass and weeds and the associated ecological habitat is considered marginal.

Thus, cadmium in surface soil at Site 03 is assumed to pose negligible risk to ecological receptors and was not retained as a COC.

SA 04

Remediation activities took place at SA 04 in 1996 which included removal and backfilling with clean soil. Thus, only samples not removed during the remediation activities were evaluated.

No analyte concentrations exceeded the ecological PRGs at the HQ=10 level. No potential risk drivers were identified for SA 04.

Understanding Ecological Risk Assessments

A HQ approach was used to characterize the risk to ecological receptors. This approach characterizes the potential effects by comparing exposure concentrations with the effects data. When HQs exceed 1, it is an indication that ecological receptors are potentially at risk, although additional evaluation or data may be necessary to confirm with greater certainty whether ecological receptors are actually at risk, especially because most benchmarks are developed using conservative exposure assumptions and/or studies. An HQ should not be construed as being probabilistic; rather, it is a numerical indicator of the extent to which an exposure point concentration exceeds or is less than a benchmark.

While an HQ of 1 was used to identify COCs in the ERA, an HQ of 10 was considered in the risk evaluation to support remedial decision-making for soils, as HQ values exceeding 10 indicate a significant potential that greater exposure could result in environmental effects.

Summary of Ecological Risk Evaluation

No COCs at Site 02 and SAs 01 and 04 were found with concentrations greater than the PRGs at the HQ=10 level indicating that ecological risks at these sites are acceptable.

Site 03 identified concentrations of cadmium greater than the PRG at the HQ=10 level; however, additional review of available toxicity reference values, benchmark screening values, and background concentrations found concentrations to be acceptable. Based on the additional toxicology data, background concentrations, and marginal habitat available to ecological receptors at this location, ecological risks are anticipated to be negligible.

Based on the findings of the ecological risk evaluation (EA November 2000), remediation of surface soil is not warranted for ecological receptors.

Remedial Action Objectives

RAOs are the goals that a cleanup plan should achieve. They are established to protect human health and the environment and to comply with all pertinent federal and state statutes and regulations. The RAOs

were developed based on the results of the HHRA and ERA conducted for the CED Area. Since there were no ecological risks identified, there are no ecological RAOs.

The RAOs for soil at the CED Area for the protection of human health are:

- Prevent exposure by future residents and other unrestricted users to soils containing COCs that exceed residential use PRGs.
- Prevent exposure by current and future site workers to soil containing site chemicals that exceed industrial PRGs.

The PRGs were developed to prevent exposure to the chemicals found in soil at the CED Area that may present human health risks above U.S. EPA target levels. In addition to the risk-based standard for Aroclor-1260, the entire CED Area must be remediated to meet the RIDEM R and I/C DEC since these are also ARARs. Table 2 presents the PRGs for the CED Area. In addition to Aroclor-1260, Table 2 includes chemicals that were detected above ARARs in soil in at least one of the Sites or SAs in the CED Area.

Table 2
Soil Preliminary Remediation Goals – Human Health

Chemical of Concern	Selected Residential PRG (mg/kg)	Basis	Selected Industrial/Commercial PRG (mg/kg)	Basis
PCBs (Aroclor-1260)	1	Federal Risk-Based Standard ¹	10	I/C DEC
Benzo(a)pyrene	0.4	R DEC	0.8	I/C DEC
Chrysene	0.4	R DEC	780	I/C DEC
Lead	150	R DEC	500	I/C DEC
Antimony	10	R DEC	820	I/C DEC
Beryllium	1.5	R DEC	1.5	I/C DEC
Cadmium	39	R DEC	1,000	I/C DEC
Manganese	390	R DEC	10,000	I/C DEC

Notes:

- 1 Federal risk-based standard developed following U.S. EPA guidance *A Guide on Remedial Actions at Superfund Sites with PCB Contamination, OSWER Directive #9355.4-01FS, August 1990*
- PRG Preliminary Remediation Goal
- mg/kg milligrams per kilogram
- R DEC RIDEM Residential Direct Exposure Criteria
- I/C DEC RIDEM Industrial/Commercial Direct Exposure Criteria

Summary of Soil Alternatives

Remedial alternatives for soil at the CED Area were developed to meet the RAOs. The remedial alternatives discussed below were presented in the Detailed Analysis phase of the FFS (Resolution Consultants May 2019).

Alternative S-1: No Action

No action consists of maintaining the status quo at the site. This alternative is used as a baseline for comparison to the other alternatives in accordance with the NCP and *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (U.S. EPA October 1988). There are no remedial actions involved with this alternative. Therefore, potentially unacceptable risks remain.

Costs

Capital Cost:	\$0
Five-Year Reviews Cost:	\$27,500
Total Present Value Cost ¹ :	\$102,000

¹ Total cost over duration of alternative in today's \$, rounded to the nearest \$1,000; assumed duration of 30 years with 10% contingency

Alternative S-2: Excavation and Off-Site Disposal or Cover with Land Use Controls

Alternative S-2, shown on Figure 6, would consist of three major components: delineation and excavation or soil cover for subsurface soil (greater than 2 feet bgs) exceeding I/C PRGs at Site 02, LUCs prohibiting residential use for the entire CED Area, and monitoring.

Surface and subsurface soil at all sites exceed residential PRGs. Surface soil at SA 01 and Site 02 and subsurface soil at SA 01, Site 03, and SA 04 do not exceed I/C PRGs. Surface soil I/C PRG exceedances at Site 03 and SA 04 were further evaluated through U.S. EPA and RIDEM-accepted evaluations and were determined to comply with the I/C PRGs. I/C PRG exceedances in subsurface soil at Site 02 will be addressed through excavation or cover. Residential PRG exceedances at these sites will be addressed by LUCs.

Alternative S-2 would achieve RAOs through the following components:

Excavation and Off-Site Disposal or Cover

- Prior to completing the remedial action, a Pre-Design Investigation (PDI) will be performed at Site 02 to confirm the presence of, and if necessary, delineate the lateral and depth extent of subsurface soil (below 2 feet bgs) above I/C PRGs.

Should PDI results show the extent of subsurface I/C DEC exceedances to be significantly larger than currently estimated (Figure 6), then use of existing surface soils (0 to 2 feet bgs) as a protective cover will be considered in the final remedy as an alternative to additional excavation of the area.

Although existing surface soil data shows no exceedances of I/C PRGs, surface soil samples will be collected and analyzed as part of the PDI effort to verify the absence of contamination in surface soils.

- For the purposes of this Proposed Plan, current estimates and costs assume that all subsurface soils

exceeding I/C PRGs at Site 02 will be excavated and backfilled. The excavation at Site 02 is presumed to be in a rectangle, centered on the historical subsurface I/C PRG exceedances, with a depth of 2 to 10 feet. The areal extent of soil with exceedances of the I/C PRGs is approximately 4,000 square feet, and the volume of impacted soil at depth is approximately 1,185 CY.

- At Site 02 the contaminated soil is only located at depth, so the overlying uncontaminated soil would be stockpiled and used as the backfill if it meets certified clean fill standards².
- Waste characterization will be performed in place prior to excavation in accordance with applicable state and federal standards and disposal facility requirements. All excavated soil would be temporarily stockpiled at an approved location for off-site disposal.
- Excavated areas will be backfilled with certified clean fill².
- Excavation depths vary and there are no adjacent structures to the excavation areas, so a combination of sloping and sheet piling would be used to maintain the stability of the sidewalls.
- During construction activities, engineering controls such as water sprinkling and environmental controls such as perimeter air quality monitoring would be implemented so that fugitive dust emissions are kept to an acceptable minimum.
- Appropriate controls such as silt fences, sediment traps, and hay bales would also be used to minimize erosion and sedimentation.
- During the remedial action, the Navy will post signage in English and Spanish notifying the public that there is an ongoing remedial action and who to contact should they have any questions.

Land Use Controls

- Since soil would remain on-site at concentrations greater than residential PRGs, LUCs would be established to prevent future residential use and thus prevent the exposure of such receptors to COCs in soil.
- If a soil cover (instead of excavation) is utilized for subsurface I/C PRG exceedances at Site 02, LUCs would also prevent I/C exposure to subsurface soil with contaminant concentrations greater than I/C

² RIDEM defines clean fill as soil that meets RIDEM R DEC. In the case of OU7, the residential PRG for PCBs is lower than the RIDEM R DEC, so clean fill must meet RIDEM R DEC for all compounds except for PCBs, where it must meet the OU7 residential PRG.

PRGs. A Soil Management Plan (SMP) would be established to prevent disturbance of the soil cover and establish the requirements when accessing soils beneath the soil cover.

- LUCs would also be required to provide routine inspection and maintenance of the cover, including restoration of the cover if removed or damaged during other site construction activities. If necessary, benchmarks would be installed at the corners of the cover area(s) so that the cover can be found and its elevation evaluated.
- LUCs that address TPH contamination at Sites 02 and 03 would be prepared and implemented under separate RIDEM authority in coordination with these CERCLA LUCs.
- Annual inspections would be conducted to verify compliance with the LUCs.
- Environmental LUCs that meet state recording standards would be included in the deed and recorded as part of eventual transfer of property including any portion of the CED Area subject to LUCs. These LUCs will be incorporated into any leases or other agreements the Navy has with third parties operating within the CED Area during the period the Navy owns the property.

Monitoring

- Annual monitoring will be performed in coordination with the LUC inspections to confirm that the protective 2-foot cover at Site 02, if implemented, remains and site conditions are in compliance with the LUC Remedial Design and SMP, as required by U.S. EPA and RIDEM.
- Since contaminants will remain on-site at levels above those allowed for UU/UE, five-year reviews of the CED Area would be conducted as part of the comprehensive former NCBC Davisville five-year review process.

Costs

<i>Capital Cost:</i>	<i>\$965,000</i>
<i>Operation and Maintenance (O&M) Cost:</i>	<i>\$15,000</i>
<i>Five-Year Reviews Cost:</i>	<i>\$25,000</i>
<i>Total Present Value Cost ¹:</i>	<i>\$1,282,000</i>

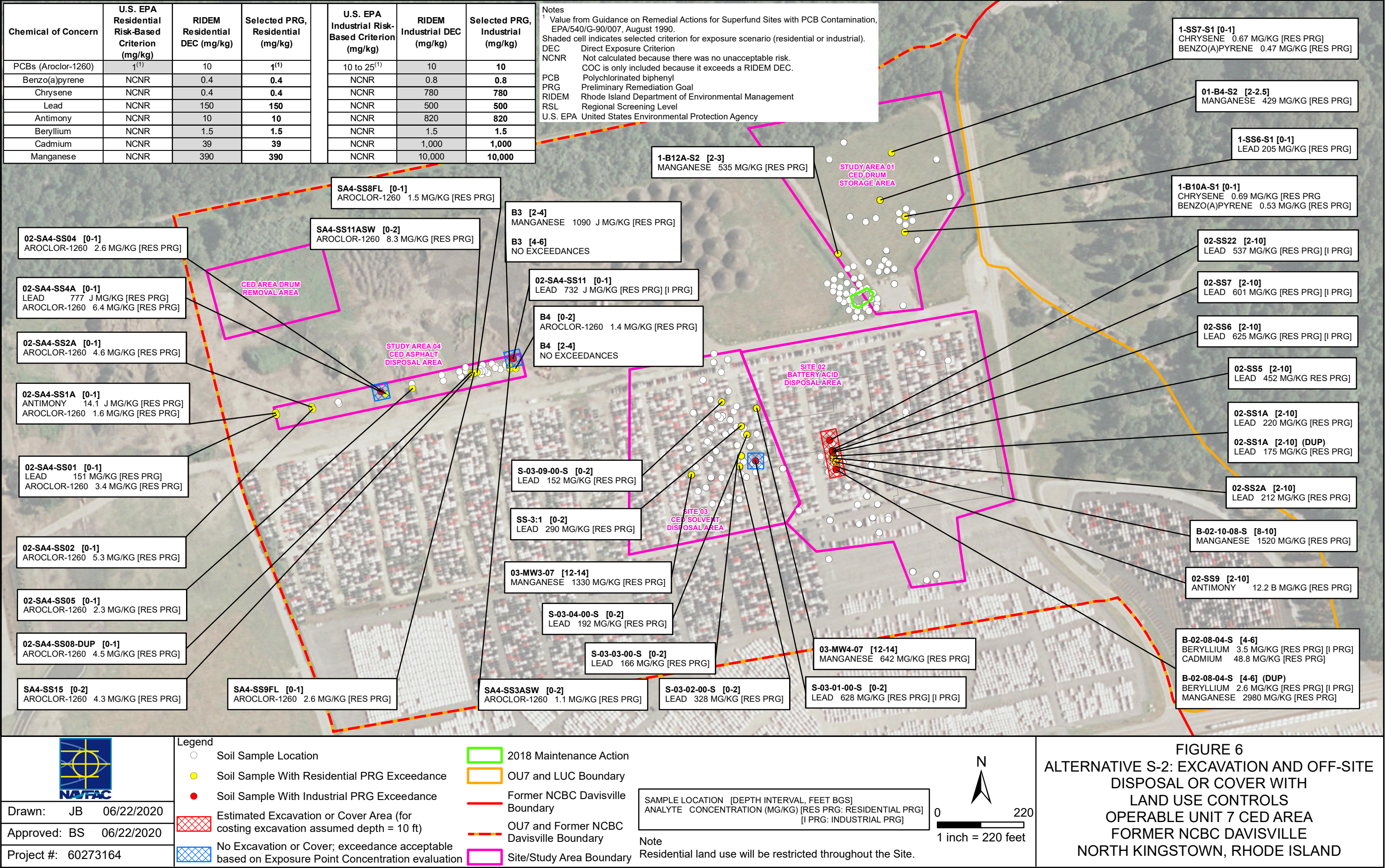
¹ Total cost over duration of alternative in today's \$, rounded to the nearest \$1,000; assumed duration of 30 years

Alternative S-3: Excavation (Residential Criteria) and Off-Site Disposal

Alternative S-3, shown on Figure 7, would consist of excavation to meet residential PRGs and off-site disposal. Soil with COC concentrations greater than residential PRGs would be excavated at the CED Area using conventional excavation equipment. Because no hazardous substances, pollutants, or contaminants would remain in soil in excess of UU/UE, no five-year reviews or LUCs for soil would be required. Alternative S-3 would achieve RAOs through the following:

- The total area of contaminated soil is estimated to be approximately 48,000 square feet, and the estimated depth of contamination is generally 2 to 4 feet bgs with two locations at 10 feet and 14 feet bgs, as shown on Figure 7. The total volume of impacted soil to be excavated would be approximately 6,900 CY. Pre-excavation sampling would be performed to verify these estimations.
- Waste characterization will be performed in place prior to excavation in accordance with applicable state and federal standards and disposal facility requirements. All excavated soil would be temporarily stockpiled at an approved location for off-site disposal.
- Following excavation, the excavated areas would be backfilled with certified clean fill² and regraded to restore current surface elevations.
- At some locations, the contaminated soil is only located at depth, so the overlying uncontaminated soil would be stockpiled and used as the backfill if it meets certified clean fill standards².
- Excavation depths vary and there are no adjacent structures to the excavation areas, so a combination of sloping and sheet piling would be used to maintain the stability of the sidewalls.
- The contaminated soil is only in the unsaturated zone, so dewatering of the excavations is not required.
- During construction activities, engineering controls such as water sprinkling and environmental controls such as perimeter air quality monitoring would be implemented so that fugitive dust emissions are kept to an acceptable minimum.

² RIDEM defines clean fill as soil that meets RIDEM R DEC. In the case of OU7, the residential PRG for PCBs is lower than the RIDEM R DEC, so clean fill must meet RIDEM R DEC for all compounds except for PCBs, where it must meet the OU7 residential PRG.



- Appropriate controls such as silt fences, sediment traps, and hay bales would also be used to minimize erosion and sedimentation.
- Excavation activities would be coordinated with other remedial activities associated with TPH, which would be performed under separate RIDEM authority
- During the remedial action, the Navy will post signage in English and Spanish notifying the public that there is an ongoing remedial action and who to contact should they have any questions.

Costs

Capital Cost:	\$3,698,000
O&M Cost:	\$0
Five-Year Reviews Cost:	\$0
Total Present Value Cost ¹ :	\$3,698,000

¹ Total cost over duration of alternative in today's \$, rounded to the nearest \$1,000; assumed duration of 30 years.

Evaluation of the Soil Alternatives

In compliance with CERCLA, the U.S. EPA has established criteria for use in comparing the advantages and disadvantages of each alternative. Nine criteria were used to evaluate the different remedial alternatives individually and against each other to select a remedy, as shown in Table 3. The nine criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria. These nine criteria are discussed below. For the complete "Detailed and Comparative Analysis of Alternatives," refer to the FFS Report (Resolution Consultants May 2019).

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with ARARs

Primary Balancing Criteria

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume through treatment
- Short-term Effectiveness
- Implementability
- Cost

Modifying Criteria

- State Acceptance
- Community Acceptance

The two modifying criteria are evaluated after receipt of state and public comments on the Proposed Plan.

Selection of a Remedy

The selection of a remedy is a two-step process. The first step consists of identification of a preferred alternative and presentation of that alternative in a Proposed Plan to the community for review and comment.

The second step consists of review of the public comments and determination of whether the preferred alternative continues to be the most appropriate remedial action for the site after obtaining the approval by U.S. EPA and in consultation with RIDEM.

Table 3
Comparison of Remedial Alternatives

Evaluation Criteria	Remedial Alternatives		
	Alternative S-1 No Action	Alternative S-2 Excavation and Off-Site Disposal or Cover with Land Use Controls	Alternative S-3 Excavation (Residential Criteria) and Off-Site Disposal
Protects human health and the environment	○	●	●
Meets Applicable or Relevant and Appropriate Requirements	○	●	●
Provides long-term effectiveness and performance	○	●	●
Reduces mobility, toxicity and volume through treatment	○	○	○
Provides short-term protection	○	●	●
Can be easily implemented	●	●	●
Cost	\$0.102M	\$1.28M	\$3.70M
State Agency Acceptance	To be determined after public comment period		
Community Acceptance	To be determined after public comment period		

Notes:

- Criteria is met by the alternative
- Criteria is not met by the alternative

PREFERRED REMEDIAL ALTERNATIVE

The Navy is proposing **Alternative S-2: Excavation and Off-Site Disposal or Cover with Land Use Controls** as its preferred action for soil at the CED Area. This approach has a low impact on the surrounding area and is consistent with the current and planned future use of the CED Area (i.e., parking lot), which does not include residential use. The preferred remedial alternative would achieve the RAOs as follows:

- Prevent exposure by future residents and other unrestricted users to soils containing COCs that exceed residential use PRGs.
 - LUCs will prohibit residential use of the CED Area.
 - Monitoring will be performed to ensure LUCs remain protective.
- Prevent exposure by current and future site workers to soil containing site chemicals that exceed industrial PRGs.
 - Subsurface soil which exceeds I/C PRGs will be delineated during a PDI. Depending on extent of contamination, these soils will either be excavated for off-site disposal and backfilled, or covered with the existing 2-foot soil cover.
 - LUCs and monitoring will be performed to ensure that the soil cover, if utilized, is maintained and protective.

Since contaminants will remain on-site at levels above those allowed for UU/UE, five-year reviews of the CED Area would be conducted as part of the comprehensive former NCBC Davisville CERCLA five-year review process. The Navy has concluded that this alternative is protective of human health and the environment and achieves the overall goals established for the CED Area. The Navy proposes that this soil alternative be the final action for the CED Area.

When completed, Soil Alternative S-2 will be:

- (1) protective of human health and the environment (e.g., achieve the site-specific RAOs);
- (2) comply with all ARARs;
- (3) provide long-term effectiveness; and
- (4) provide a cost-effective action that can be easily implemented using proven technology.

Among the Soil Alternatives, Alternative S-2 is preferred over Alternative S-3 because the excavation or cover with LUCs is most compatible with the planned future use of the area and because it has much less of an impact on the surrounding areas than a larger soil excavation (Alternative S-3), which would disturb the area with noise and truck traffic for a longer period of time. Although the CERCLA preference for treatment relegates off or on-site disposal as less preferable remedial options than treatment, for the marginally-contaminated soil that is present in the CED Area the off-site disposal/on-site cover (Alternative S-2) or off-site disposal (Alternative S-3) remedial options can be effective remedial measures to address site contaminants. The cost for Alternative S-2 is also lower than Alternative S-3. Alternative S-2 is more sustainable than Alternative S-3 as it generates less waste required for disposal. Furthermore, Alternative S-3 is not necessary since the planned future use of the area does not include residential use. Alternative S-1 is not a viable alternative because it would not meet the Threshold Criteria of providing overall protection of human health and the environment and compliance with ARARs.

COMMENTS AND FEEDBACK

Community acceptance of this Proposed Plan is the next step in the cleanup process for the CED Area. The public is encouraged to review this plan and submit comments to the Navy. You don't have to be a technical expert to comment. The Navy would like to know your thoughts before making a final decision on whether **Alternative S-2: Excavation and Off-Site Disposal or Cover with Land Use Controls** is appropriate for the CED Area.

During the public comment period from July 9 through August 8, 2020, the Navy will accept formal written comments on this Proposed Plan. The Navy will also hold a public information meeting to accept either oral or written comments. It is important to note that the regulations distinguish between "formal" comments received during the comment period and "informal" comments received outside of the public comment period. While the Navy uses comments throughout the cleanup process to help make cleanup decisions, it is required to respond to formal comments in writing (See *Understanding the Formal Comment Process*).

The date, time, and place of the public meeting are provided on the first page of this Proposed Plan.

NEXT STEPS

Once the community has commented on this Proposed Plan, the Navy, RIDEM, and U.S. EPA will consider all comments received. It is possible that this Proposed Plan could change based on comments received from the community. The Navy is required by law to provide written responses to all formal comments received on the Proposed Plan. The responses to public comments will be provided in a document called a Responsiveness Summary, which will be attached to the ROD for the CED Area.

Once the comments have been reviewed, the Navy will develop the ROD for the CED Area. The ROD is the document containing the rationale for selection of a remedy for a site and summarizes community participation in the cleanup selection process.

After the Record of Decision

After the ROD is signed, the Navy will design and implement the selected alternative by combining existing data and information with the data and information gained from the to-be-completed Site 02 PDI and preparing an engineering design of the selected actions. After the design is complete, the Navy will implement and oversee the excavation or cover and LUC activities to ensure that the actions are properly implemented.

COMMITMENT TO THE COMMUNITY

The Navy is committed to keeping the community informed on the environmental cleanup programs at former NCBC Davisville. A Restoration Advisory Board (RAB), composed of community and government agency representatives, meets annually to discuss the environmental cleanup programs at former NCBC Davisville. At these meetings, community RAB members can provide local input and offer suggestions on program activities. Upcoming RAB meetings are publicized in local news media and are open to the public.

If you would like further information about the RAB or the environmental restoration program at former NCBC Davisville, please contact the Navy at the address provided on page 1 of this Proposed Plan.

UNDERSTANDING THE FORMAL COMMENT PROCESS

Formal comments are used to improve the cleanup process. During the 30-day formal comment period, the Navy will accept formal written comments and hold a public hearing to accept formal verbal comments.

To make a formal comment on this Proposed Plan, you need only

- 1) offer oral or written comments during the public hearing on July 23, 2020, or
- 2) send written comments, postmarked, faxed, or emailed no later than August 8, 2020, to:

Mr. Todd Bober
BRAC PMO Northeast
Building 679, Naval Business Center
4911 South Broad Street
Philadelphia, Pennsylvania 19112-1303
todd.bober@navy.mil

For written comments, a comment sheet is attached at the back of this proposed plan.

Your formal comments will become a part of the official record for the CED Area and a crucial element in the decision-making process for the CED Area. The Navy will consider all comments received during the comment period prior to making the final cleanup decision.

A transcript of formal comments and the Navy's written responses will be issued in a document called a Responsiveness Summary that will accompany the ROD for the CED Area.

GLOSSARY OF TERMS

Applicable Relevant and Appropriate Requirements (ARARs): Federal and state environmental laws/regulations and state facility siting laws/regulations that the alternatives must meet. These laws vary depending upon the alternative(s) selected.

Background (Conditions, Levels, or Values): Occurring naturally in the environment (soil, groundwater). Also includes anthropogenic background (man-made contaminants present in the environment as a consequence of non-Navy sources.)

Carcinogens: Chemicals that cause cancer.

Chemicals of Concern (COCs): Chemicals of concern are chemicals identified in the risk assessments as the primary drivers of unacceptable risks.

Chemicals of potential concern (COPCs): Chemicals found at a site in concentrations above federal and state default-based risk-screening levels.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA), commonly known as **Superfund**. The Navy's cleanup of sites regulated by CERCLA/SARA is funded by the Department of Defense under the Defense Environmental Restoration Fund.

Feasibility Study (FS): A description and engineering study of the potential cleanup alternatives for a site.

Industrial/Commercial: Only industrial and/or commercial activities are permitted and residential/recreational use is prohibited.

Land Use Control (LUC): A legal or administrative restriction that prevents access or certain uses of land.

National Contingency Plan (NCP): The NCP (40 Code of Federal Regulations Part 300) is the regulation that implements CERCLA. The NCP specifies procedures, techniques, materials, equipment, and methods to be employed in identifying, removing, or remediating releases of hazardous substances. In particular, the NCP specifies procedures for determining the appropriate type and extent of remedial action at a site in order to effectively mitigate and minimize damage to, and provide adequate protection of, human health, welfare, and the environment.

Non-carcinogens: Chemicals that may cause adverse effects other than cancer.

Operable Unit (OU): A site or sites being addressed collectively under the CERCLA process.

Preferred Alternative: The remedy recommended by the Navy for cleaning up a site. The remedy may be modified or changed based on comments received during the Public Comment Period.

Preliminary Remedial Goals (PRGs): Preliminary cleanup concentrations for individual contaminants of concern in each media that will be finalized, after public comment is considered, in the ROD (where they will then be termed Remediation Goals).

Proposed Plan (PP): A document that summarizes the preferred cleanup remedy for a site and encourages and facilitates public involvement in the cleanup selection.

Receptor: An individual, either a human, plant, or animal, that may be exposed to a chemical present at the Site.

Record of Decision (ROD): A legal, technical, and public document that explains the rationale and ultimate cleanup decision for a given site or operable unit. It also summarizes the public's involvement in the cleanup decision.

Remedial Action Objectives (RAOs): The final cleanup objective that must be met by the selected remedial alternative. This term is used as a technical definition of "cleanup objectives".

Remedial Investigation (RI): A step in the cleanup process that is completed to gather sufficient information to support selection of a cleanup approach to a site. The RI involves site characterization – or collection of data and information necessary to characterize the nature and extent of contamination at a site. The RI also determines whether or not the contamination presents a significant risk to human health or the environment.

Responsiveness Summary: A summary of oral or written public comments received during the public comment period for the Proposed Plan. This summary is attached to the Record of Decision for a site.

Risk Assessment: The evaluation and estimation of the current and future potential for adverse human health and/or ecological effects from exposure to contaminants. A human health risk assessment is an evaluation of current and future potential for adverse human health effects from exposure to site contaminants. An ecological risk assessment is a study that evaluates the potential risk to ecological receptors (various types of plants and animals) from contaminants at a site.

Surface Soil: The soil interval between the ground surface and 2 feet below ground surface.

Subsurface Soil: The soil beneath the surface soil.

Superfund: Another name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see above).

LIST OF ACRONYMS

<u>A</u>		<u>N</u>	
ARAR	Applicable or Relevant and Appropriate Requirement	Navy	United States Department of the Navy
<u>B</u>		NCBC	Naval Construction Battalion Center
bgs	Below ground surface	NCP	National Oil and Hazardous Substances Pollution Contingency Plan
BRAC	Base Realignment and Closure	<u>O</u>	
<u>C</u>		O&M	Operation and maintenance
CED	Construction Equipment Department	OU	Operable unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	<u>P</u>	
COC	Chemical of concern	PAH	Polycyclic aromatic hydrocarbons
COPC	Chemical of Potential Concern	PCB	Polychlorinated biphenyl
CY	Cubic yards	PDI	Pre-Design Investigation
<u>D</u>		PRG	Preliminary remediation goal
DEC	Direct Exposure Criteria	<u>Q</u>	
<u>E</u>		QDC	Quonset Development Corporation
EA	EA Engineering, Science, and Technology	<u>R</u>	
ERA	Ecological risk assessment	R	Residential
<u>F</u>		RAB	Restoration Advisory Board
FFS	Focused Feasibility Study	RAO	Remedial action objective
FS	Feasibility Study	RfD	Reference dose
<u>H</u>		RI	Remedial Investigation
HHRA	Human health risk assessment	RIDEM	Rhode Island Department of Environmental Management
HHRE	Human health risk evaluation	ROD	Record of Decision
HI	Hazard index	<u>S</u>	
HQ	Hazard quotient	SA	Study Area
<u>I</u>		SMP	Soil Management Plan
I/C	Industrial/commercial	<u>T</u>	
<u>L</u>		TCRA	Time Critical Removal Action
LUC	Land use control	TPH	Total petroleum hydrocarbon
<u>M</u>		<u>U</u>	
mg/kg	milligrams per kilogram	µg/dL	micrograms per deciliter
		U.S. EPA	United States Environmental Protection Agency
		USCOE	United States Army Corps of Engineers
		UU/UE	Unrestricted Use and Unlimited Exposure

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USE THIS SPACE TO WRITE YOUR COMMENTS

The Navy encourages your written comments on the Proposed Plan for the CED Area, OU 7, at former NCBC Davisville. You can use the form below to send written comments. If you have questions about how to comment, please call the Navy Remedial Project Manager (Mr. Todd Bober) at (215) 897-4911. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than August 8, 2020 to:

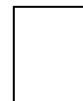
Mr. Todd Bober
Remedial Project Manager
BRAC PMO East
4911 South Broad Street
Philadelphia, PA 19112-1303
or email to: todd.bober@navy.mil

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Comment Submitted by: _____

Address:

Fold on line, staple, stamp, and mail



Mr. Todd Bober
Remedial Project Manager
BRAC PMO East
4911 South Broad Street
Philadelphia, PA 19112-1303

FOR MORE INFORMATION...

Contacts

If you have questions or comments about this Proposed Plan, or any other questions, please contact us:

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Information Repositories

Documents relating to environmental cleanup activities for former NCBC Davisville are available for public review at the following information repository:

Annex Building
Quonset Development Corporation
95 Cripe Street
North Kingstown, Rhode Island 02852
(401) 295-0044

VISIT OUR WEBSITE:

https://www.bracpmo.navy.mil/brac_bases/northeast/construction_battalion_davisville.html

click on the link for "Documents",
then click on the "NCBC Davisville" link to view
documents in the Administrative Record, and
search on "Construction Equipment Department"